

Understanding Children's Total Dietary Exposure to Pesticides

Jeffrey Morgan

Research Chemist

U.S. EPA Office of Research and Development (ORD)/National Exposure Research Laboratory (NERL)/Microbiological and Chemical Exposure Assessment Research Division (MCEARD)/Chemical Exposure Research Branch (CERB)

(513) 569-7738

morgan.jeffrey@epa.gov

Authors: Jeffrey Morgan, Craig Bernard, Lisa Melnyk

U.S. EPA ORD/NERL/MCEARD/CERB

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Recent residential monitoring studies have demonstrated that a significant portion of total exposure of infants and children to environmental contaminants can result from contamination of food in the home. Children's foods become contaminated through handling and contact with surfaces. Through a series of collaborations with industry, academia, and other federal agencies, the U.S. Environmental Protection Agency (U.S. EPA) is gaining a better understanding of the influence of eating activities on children's total dietary exposure to pesticides.

The Children's Lead Study was used to produce preliminary tools for collection of dietary exposure information. This study has impacted current and future children's exposure monitoring studies by providing a foundation for refining dietary collection protocols. An important finding from this study was the need to incorporate children's unstructured eating activities into the assessment of their dietary exposures. These activities consist of food handling where contamination may occur through direct contact with surfaces and/or hands.

New approaches to define children's activity patterns are being evaluated including accelerometers, handling of a standard food, and activity logs. Information collected in these studies will be used to refine a model that estimates children's dietary exposures and incorporates terms to account for food contamination in the home. In support of this model, in-house experimental studies have been conducted to develop procedures for measuring pesticides on household surfaces. In addition, dietary analytical methods developed in-house have been utilized in association with academia to measure pesticide exposures of farm worker's children in the Salinas Valley, CA.

Dietary sample collection presents a burden to study participants, and analyses are expensive. In an effort to minimize burden and cost, population-based alternatives to individual monitoring are being investigated. Scientists from the NERL and other federal agencies are designing pilot programs for the National Children's Study in which this population-based approach will be utilized.

These studies will provide a better understanding of how children are exposed to pesticides via the dietary pathway. Overall, these collaborations provide a link between pathway-specific exposure research and comprehensive multi-agency exposure monitoring programs. Ultimately,

